# FieldPoint™

## cFP-20*xx* Quick Start Guide

### What You Need to Get Set Up

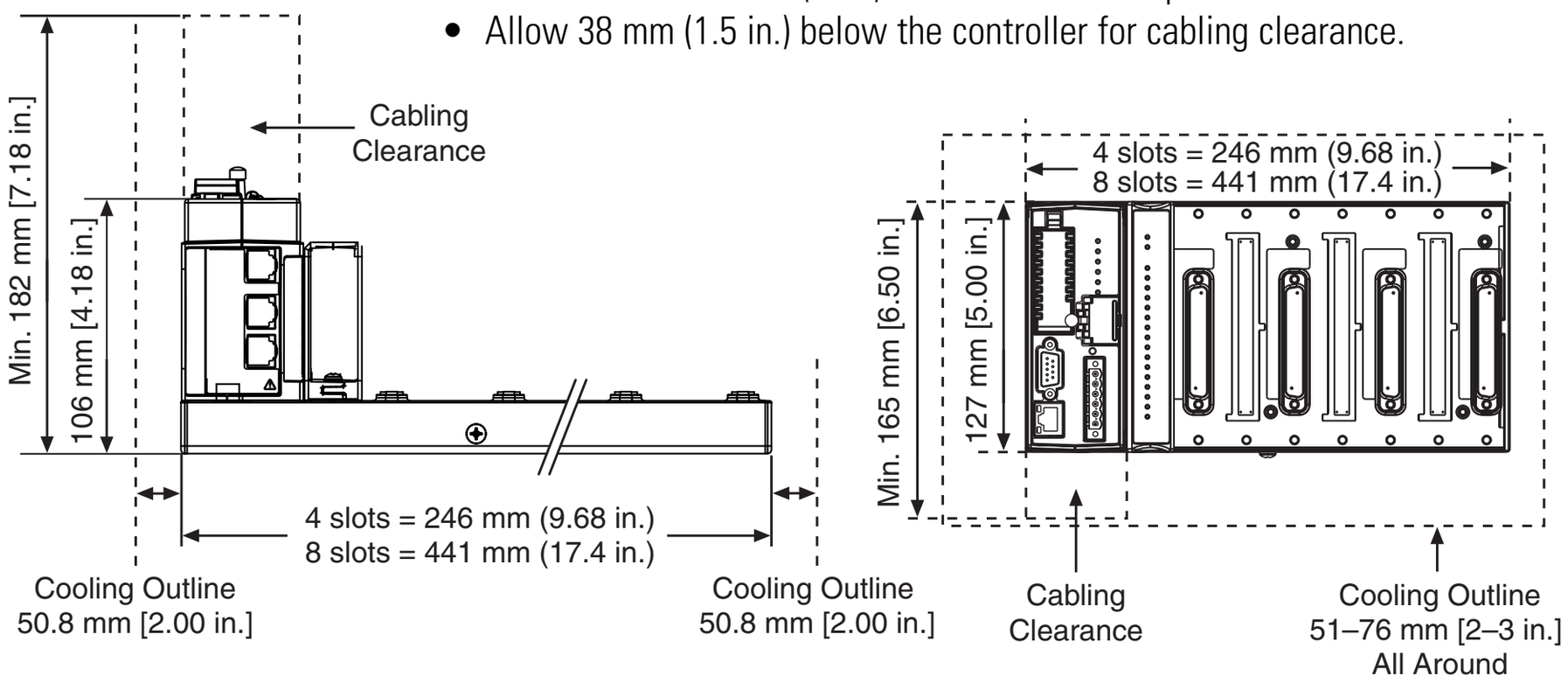
- cFP-20*xx* LabVIEW RT controller
- Mounting hardware (DIN rail, panel-mount, or rack-mount accessory)
- I/O module(s)
- Connectivity accessories: connector blocks, cables
- 11–30 V power supply
- Accessories: Ethernet cable, screwdriver
- PC running Windows
- FieldPoint software 3.0.2 or later
- LabVIEW RT

## 1 Mount the Compact FieldPoint Backplane

You can mount the cFP-BP-*x* backplane on a 35 mm DIN rail, on a panel, or in a standard 19 in. rack. Before using any of these mounting methods, record the serial number from the back of the backplane.

**CAUTION** Keep in mind these requirements for space and cabling clearance:

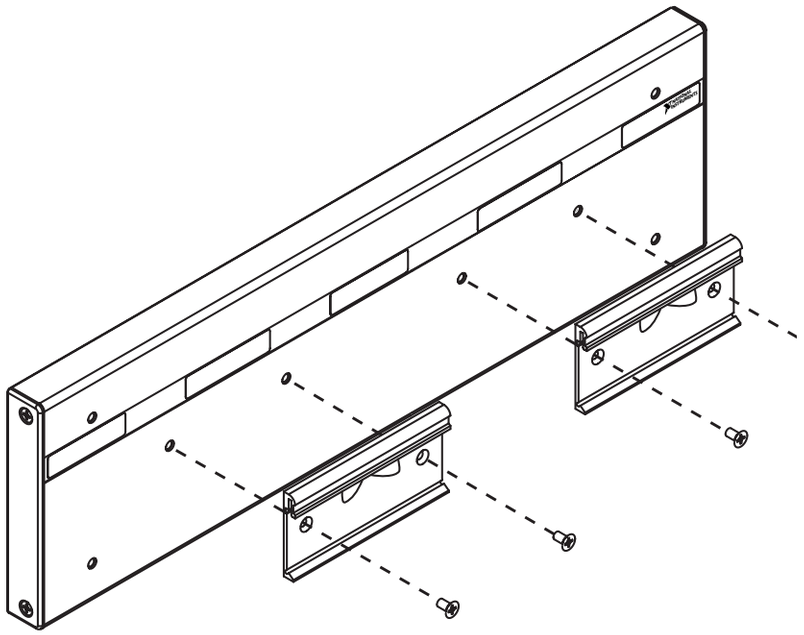
- Allow at least 51 mm (2 in.) all around the backplane for air circulation.
- Allow 38 mm (1.5 in.) below the controller for cabling clearance.

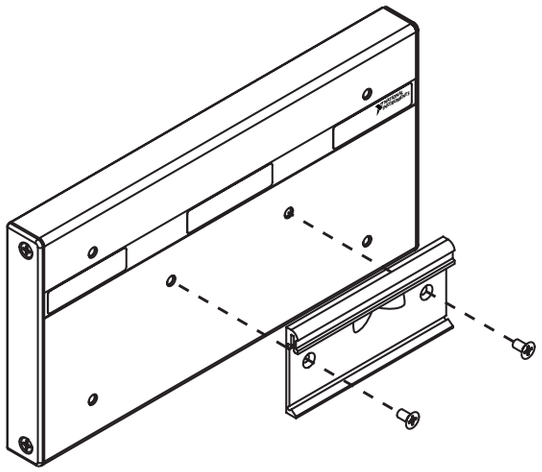

Min. 182 mm [7.18 in.]
106 mm [4.18 in.]
Cabling Clearance
4 slots = 246 mm (9.68 in.)
8 slots = 441 mm (17.4 in.)
Cooling Outline
50.8 mm [2.00 in.]
Cooling Outline
50.8 mm [2.00 in.]
4 slots = 246 mm (9.68 in.)
8 slots = 441 mm (17.4 in.)
Min. 165 mm [6.50 in.]
127 mm [5.00 in.]
Cabling Clearance
Cooling Outline
51–76 mm [2–3 in.]
All Around

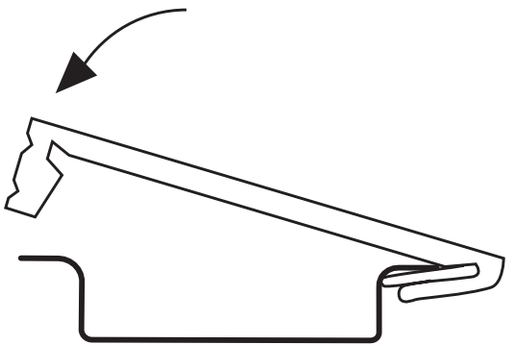
## *Mounting the Backplane on a DIN Rail*

A. Fasten the DIN rail clip(s) to the cFP-BP-*x* using a number 2 Phillips screwdriver and the 8-32 × 5/16 in. countersink screws shipped with the clip(s).

**CAUTION** Do not use screws longer than 5/16 in. to fasten the DIN rail clip to the backplane.







B. Insert one edge of the DIN rail into the deeper opening of the DIN rail clip.

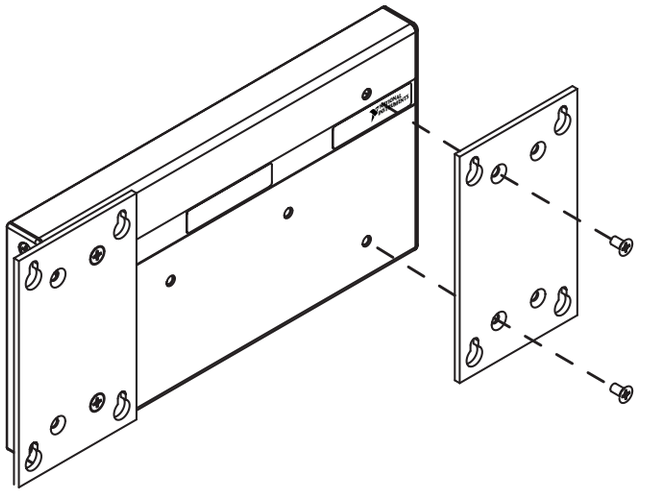
C. Press down firmly on the backplane to compress the spring until the clip locks in place on the DIN rail.

D. Connect the PE ground terminal on the cFP-BP-*x* to safety ground.

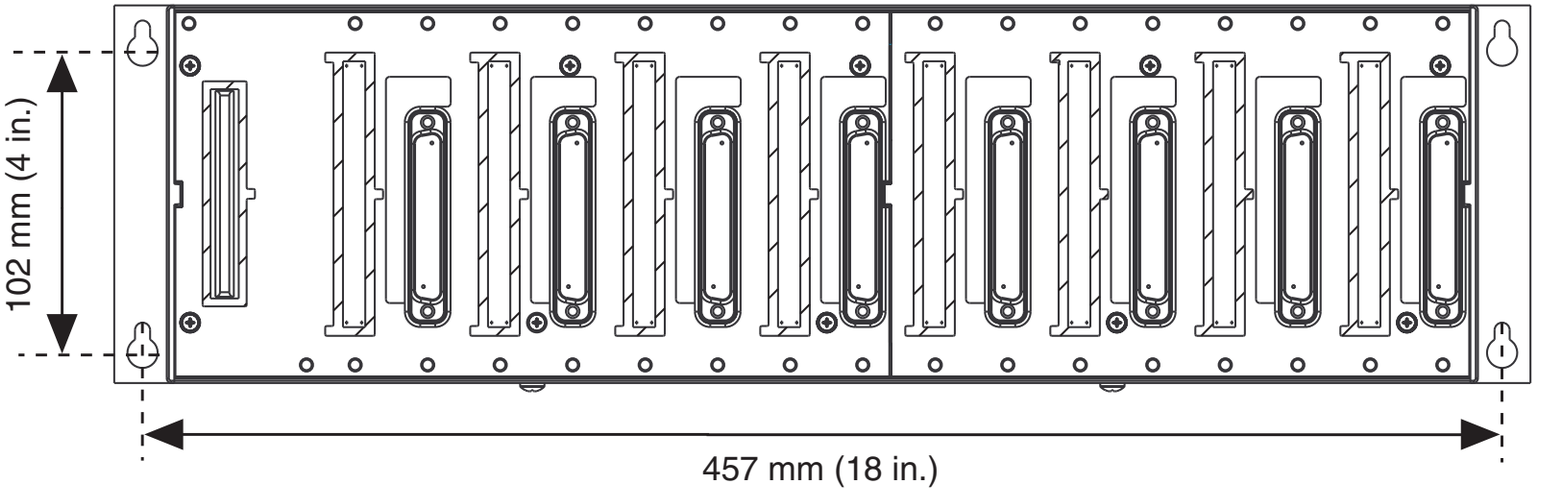
**CAUTION** Disconnect power before removing the backplane from the DIN rail.

## *Mounting the Backplane on a Panel*

A. Fasten the panel-mount plates to the back of the cFP-BP-*x* using a number 2 Phillips screwdriver and the 8-32 × 5/16 in. countersink screws shipped with the kit.



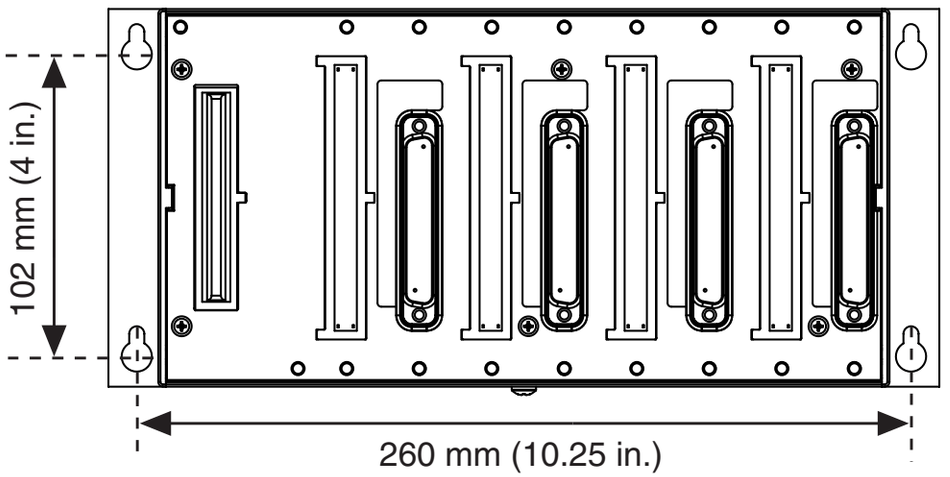
**CAUTION** Do not use screws longer than 5/16 in. to fasten the panel-mount plates to the backplane.




B. Bolt or screw the panel-mount accessory to a panel.

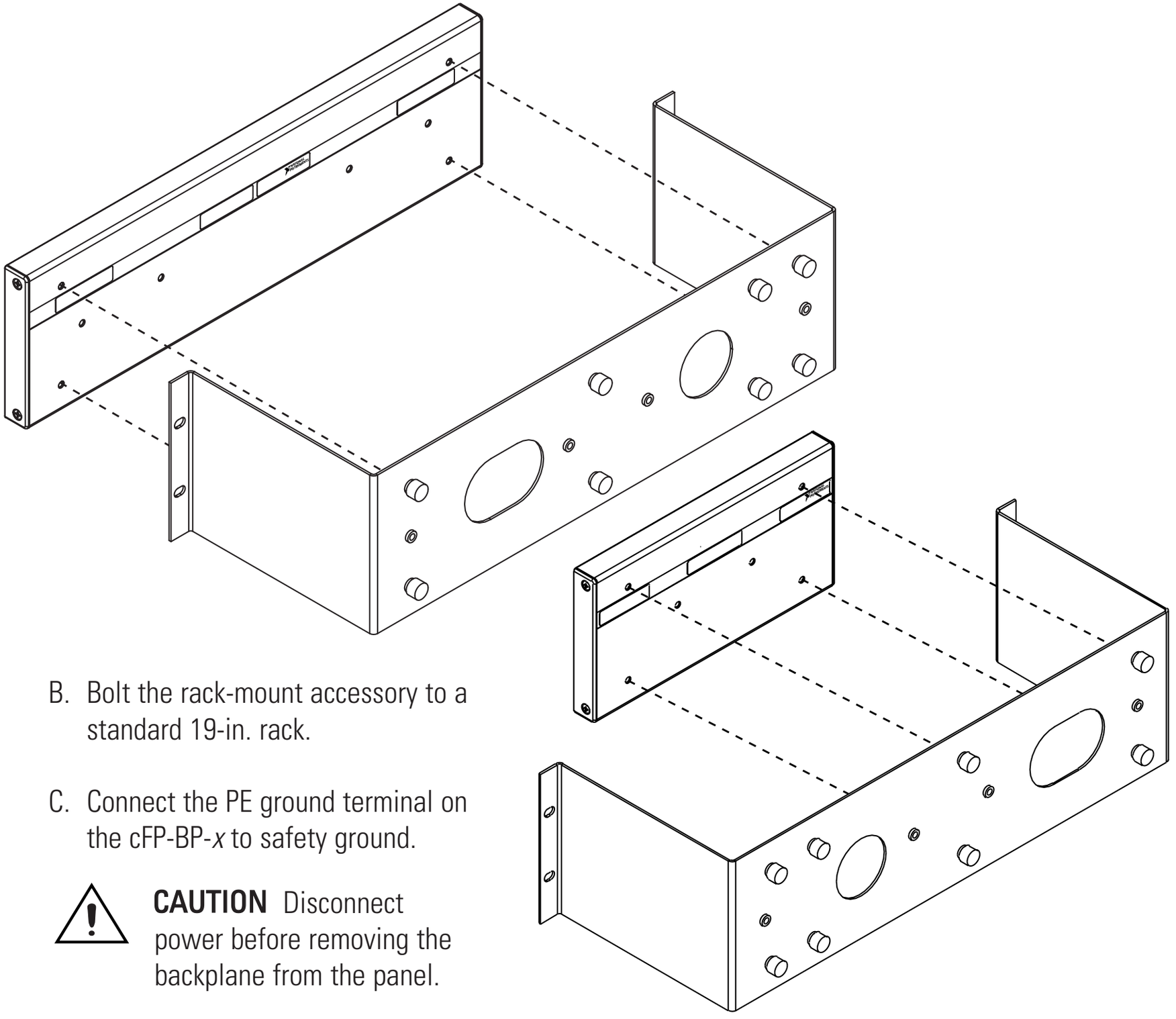
C. Connect the PE ground terminal on the cFP-BP-*x* to safety ground.

**CAUTION** Disconnect power before removing the backplane from the panel.



## *Mounting the Backplane in a Standard 19-in. Rack*

A. Fasten the rack-mount bracket to the back of the cFP-BP-*x* using the captive screws on the bracket.



B. Bolt the rack-mount accessory to a standard 19-in. rack.

C. Connect the PE ground terminal on the cFP-BP-*x* to safety ground.

**CAUTION** Disconnect power before removing the backplane from the panel.

## 2 Install the cFP-20*xx* Controller on the Backplane

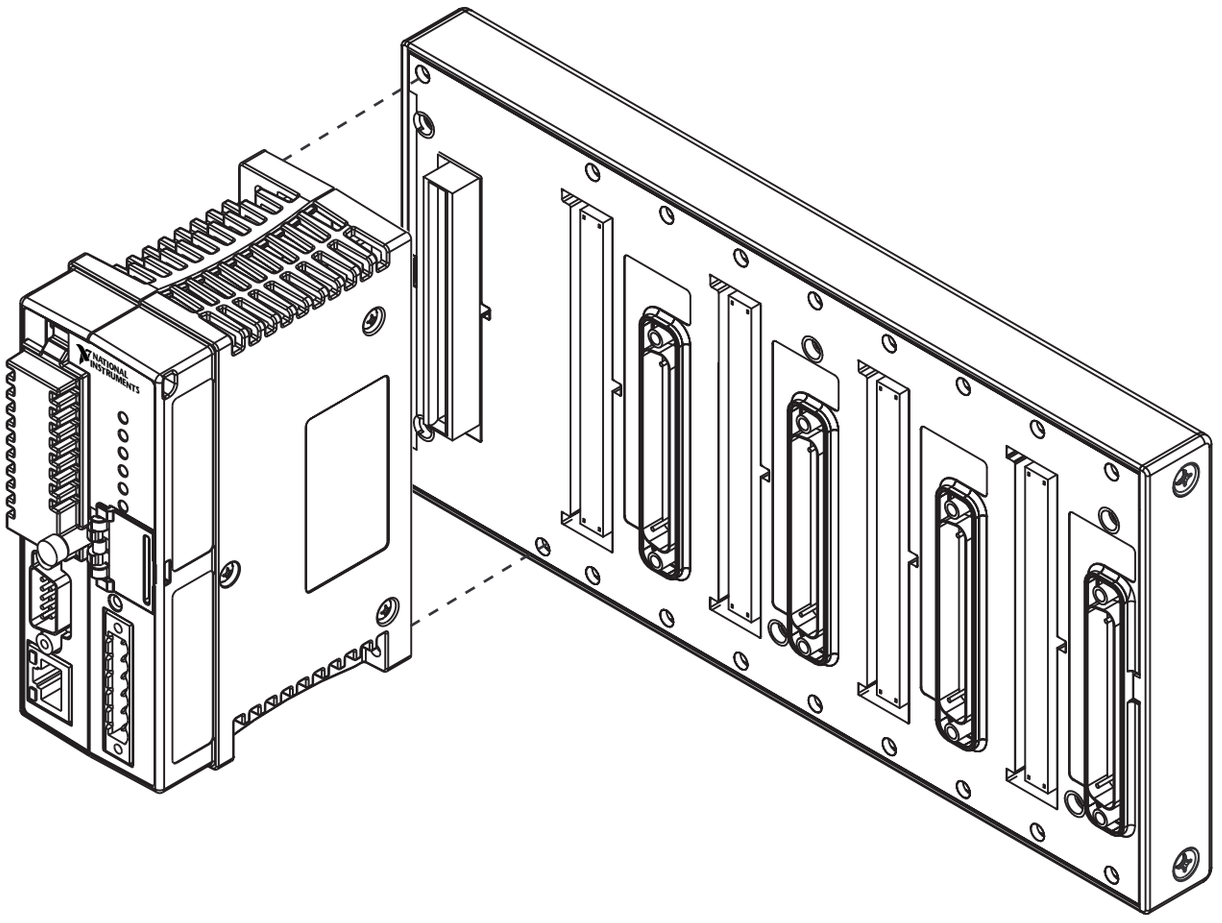
A. Make sure that no power is connected to the controller or the backplane.

B. Make sure that the cFP-20*xx* controller is right side up with the NI logo at the top, and align the captive screws on the controller with the holes on the backplane.

C. Seat the card edge at the back of the controller in the card-edge connector on the backplane.

D. Press the controller firmly to seat it on the backplane.

E. Using a number 2 Phillips screwdriver with a shank of at least 64 mm (2.5 in.) length, tighten the captive screws to 1.1 N · m (10 lb · in.) of torque.



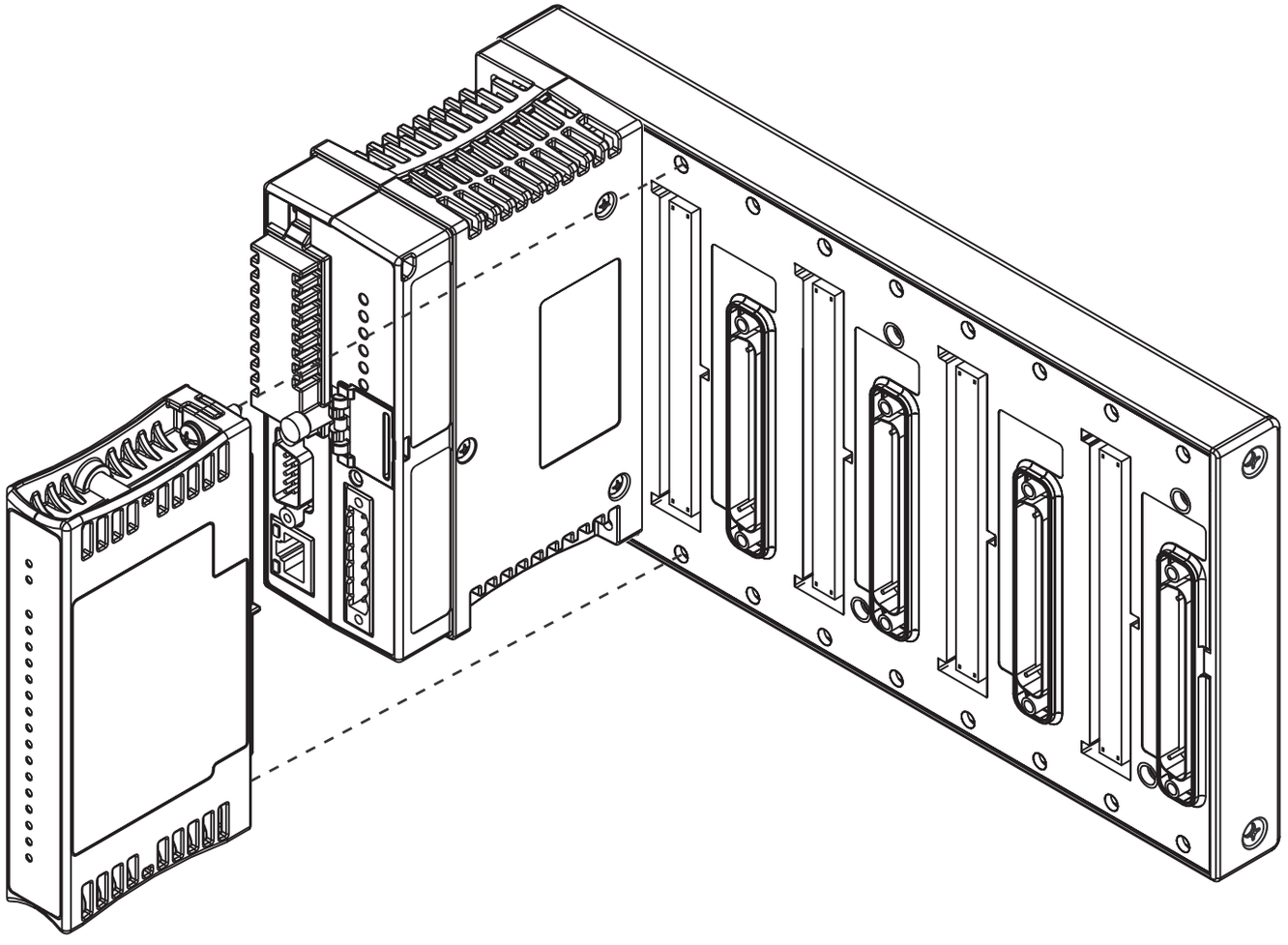
## 3 Install I/O Modules on the Backplane

A. Align the captive screws on the I/O module with the holes on the backplane.

B. Press firmly to seat the I/O module on the backplane.

C. Using a number 2 Phillips screwdriver with a shank of at least 64 mm (2.5 in.) length, tighten the captive screws to 1.1 N · m (10 lb · in.) of torque.

D. Repeat this procedure to install additional I/O modules on the backplane.



# 4 Install Connector Blocks on the Backplane

In order to connect I/O modules to input signals or to external loads, you need to install a cFP-CB-*x* connector block or other connectivity accessory for each I/O module on the backplane. Use the connector socket to the right of each I/O module socket.

A. Wire field devices as described in the I/O module operating instructions.

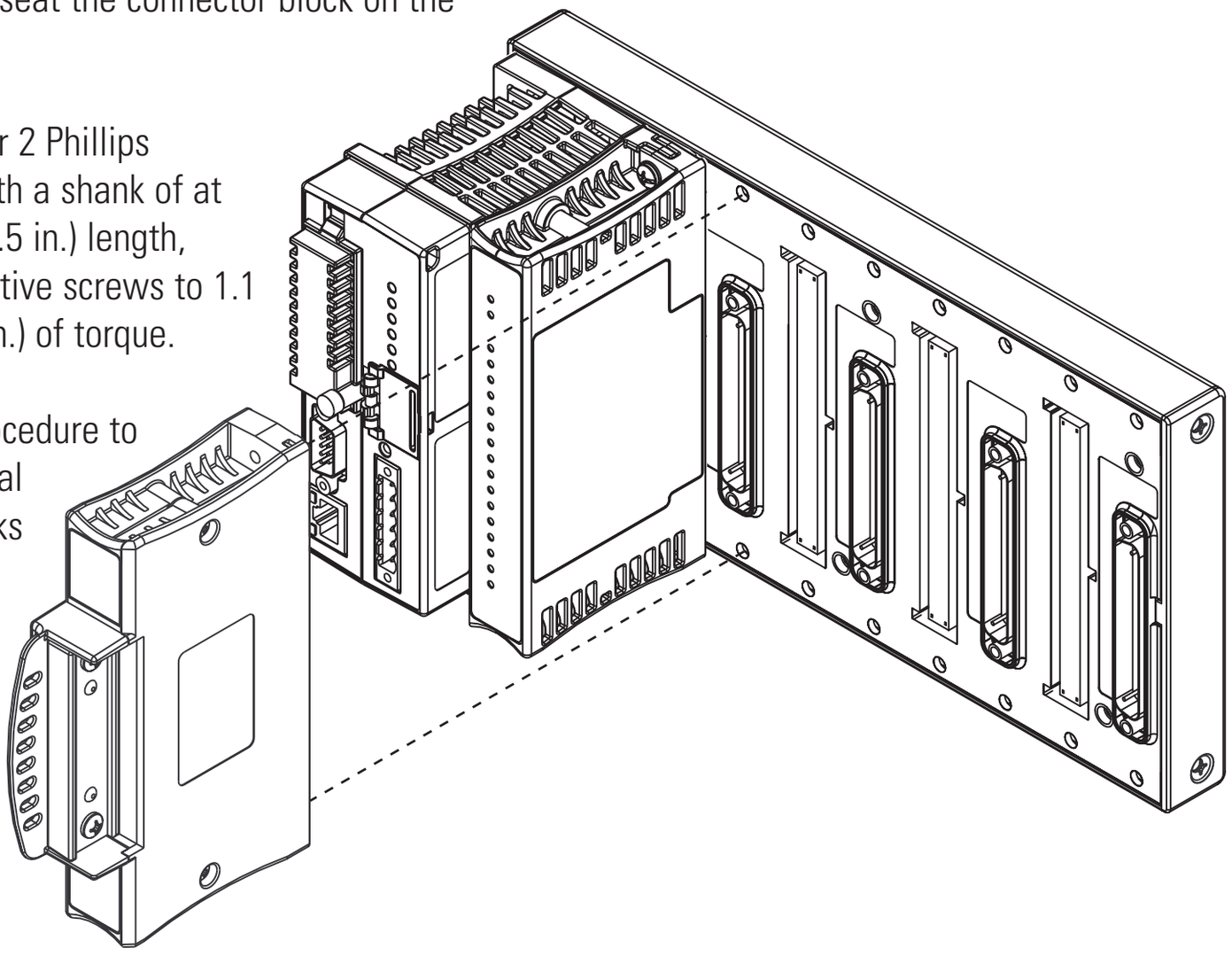
B. Align the captive screws on the connector block with the holes on the backplane.

C. Press firmly to seat the connector block on the backplane.

D. Using a number 2 Phillips screwdriver with a shank of at least 64 mm (2.5 in.) length, tighten the captive screws to 1.1 N · m (10 lb · in.) of torque.

E. Repeat this procedure to install additional connector blocks on the backplane.

**CAUTION** Hazardous voltage wiring should be performed by qualified personnel and in accordance with local electrical standards.



## 5 Connect the cFP-20*xx* to Your Network

Connect the cFP-20*xx* controller to an Ethernet network using the RJ-45 Ethernet port on the controller. Use a standard Category 5 Ethernet cable to connect the cFP-20*xx* to an Ethernet hub, or use an Ethernet crossover cable to connect the controller directly to a computer.

**CAUTION** To prevent data loss and to maintain the integrity of your Ethernet installation, do not use a cable longer than 100 m. If you are using a 100 Mbps Ethernet, National Instruments recommends using a Category 5 shielded twisted-pair Ethernet cable.

If the host PC is already configured on a network, you must configure the cFP-20*xx* on the same network. If neither is connected to a network, you can connect the two directly using a crossover cable.

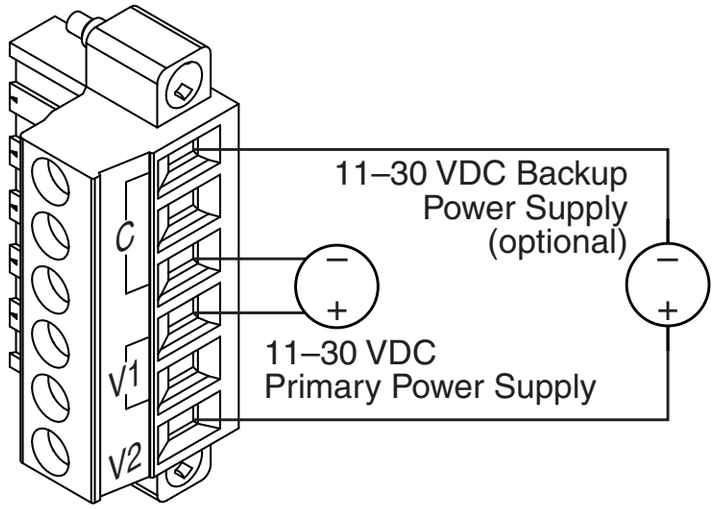
In order to configure the cFP-20*xx*, it must reside on the same subnet as the host PC. If you want to use the cFP-20*xx* on a subnet other than the one the host PC is on, first connect and configure it on the same subnet as the host PC, then reassign a static IP address for the subnet where you want it to be and physically move it to the other subnet.

## 6 Wire Power to the Compact FieldPoint System

Each cFP-20*xx* on your network requires an 11–30 VDC power supply.

A. Connect the positive lead of the primary power supply to one of the V1 terminals and the negative lead to one of the C terminals.

B. If you are using a backup power supply, connect the positive lead to V2 and the negative lead to one of the C terminals. The cFP-20*xx* uses the power supply with the higher voltage level. V2 is isolated from the other V terminals.



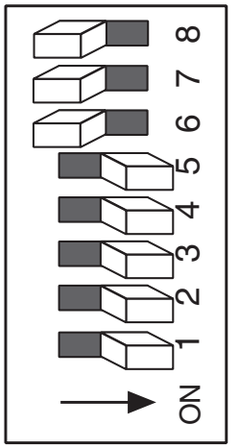
C. Use a separate power supply for each module that needs external power.

**CAUTION** Cascading power defeats isolation between the cascaded modules.

D. Refer to the operating instructions for the power requirements of each I/O module. If a module requires external power, connect a power supply to the V and C inputs on the connector block for that module. If you want to power field I/O devices from a connector block, supply power to the connector block, and then connect the connector block V and C output terminals to the field device.

## 7 Powering Up the cFP-20xx

Check the DIP switches on the controller, making sure that the RESET IP switch is not enabled. Plug in each power supply to the Compact FieldPoint system. The cFP-20*xx* runs a power-on self test (POST) that takes several seconds. You should see the POWER and STATUS LEDs come on. After about five seconds, the STATUS LED begins flashing. The cFP-20*xx* is ready to be configured, and you can install the FieldPoint software.




| DIP Switches | Functions |
|---|---|
| 1, 2 | User-configurable on cFP-2000 and cFP-2010; disabled on cFP-2020 |
| 3, 4, 5 | User-configurable |
| 6 | DISABLE VI |
| 7 | SAFE MODE |
| 8 | RESET IP |

If you have already assigned an IP address to the cFP-20*xx,* the STATUS LED turns off, and the A, B, C, and D LEDs come on for about 15 seconds as LabVIEW RT starts up. Once they turn off, the I/O module READY LEDs come on, and the cFP-20*xx* is ready for use. The total boot time for a configured system is 30–45 seconds.

If the STATUS LED does not light up as described here, refer to the *cFP-20xx and cFP-BP-x User Manual.*

## 8 Install Software on the Host PC

A. Install the software packages you plan to use, such as LabVIEW, LabVIEW RT, Lookout, Measurement Studio, or LabWindows/CVI, before you install the FieldPoint software. The FieldPoint software installation installs the LabVIEW VIs and examples, Lookout driver class, and LabWindows/CVI instrument driver only if it finds the corresponding development software installed.

B. Close all other applications.

C. Insert the FieldPoint software CD into the CD-ROM drive on your computer.

D. Follow the onscreen instructions to complete the installation.

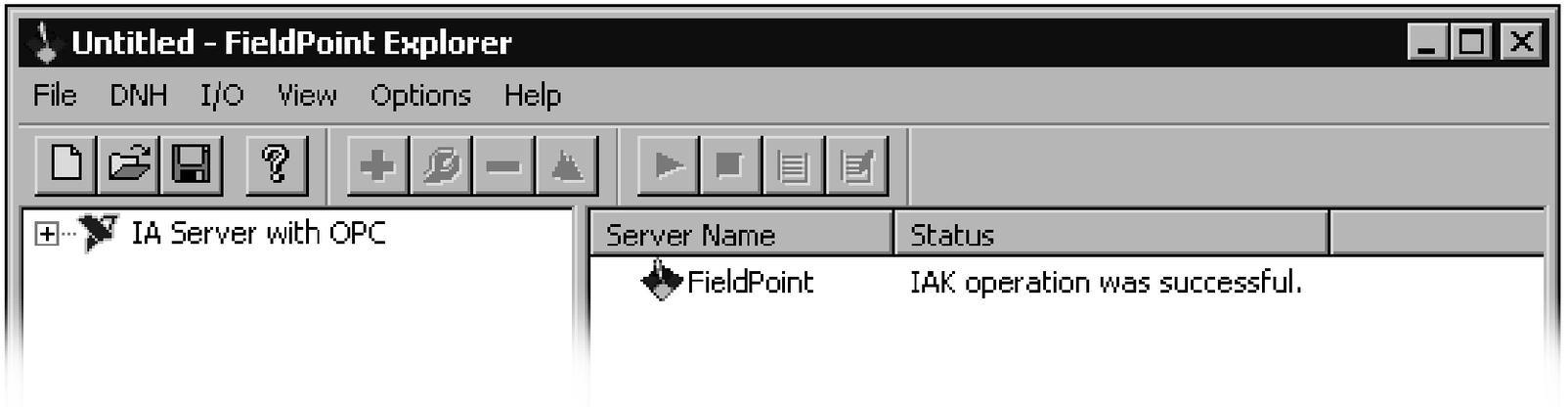
**NOTE** If the setup does not launch automatically, select **Start»Run** from Windows, enter `d:\setup`, where `d` is the letter of your CD-ROM drive, and select **OK**.

## 9 Configure the cFP-20*xx* in FieldPoint Explorer

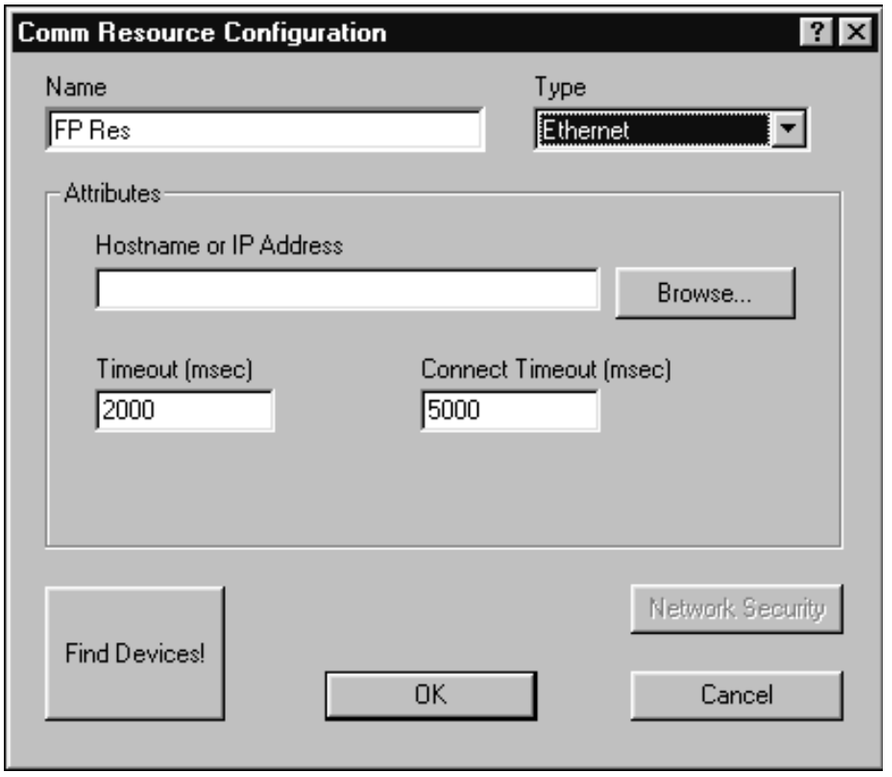
If you do not have version 3.0.2 or later of FieldPoint Explorer, download the current version from `ni.com` and install it on the PC.

A. Verify that the Compact FieldPoint system is powered on.

B. From the Windows Start menu, select **Programs»National Instruments FieldPoint»FieldPoint Explorer** to launch FieldPoint Explorer, shown in the following figure.

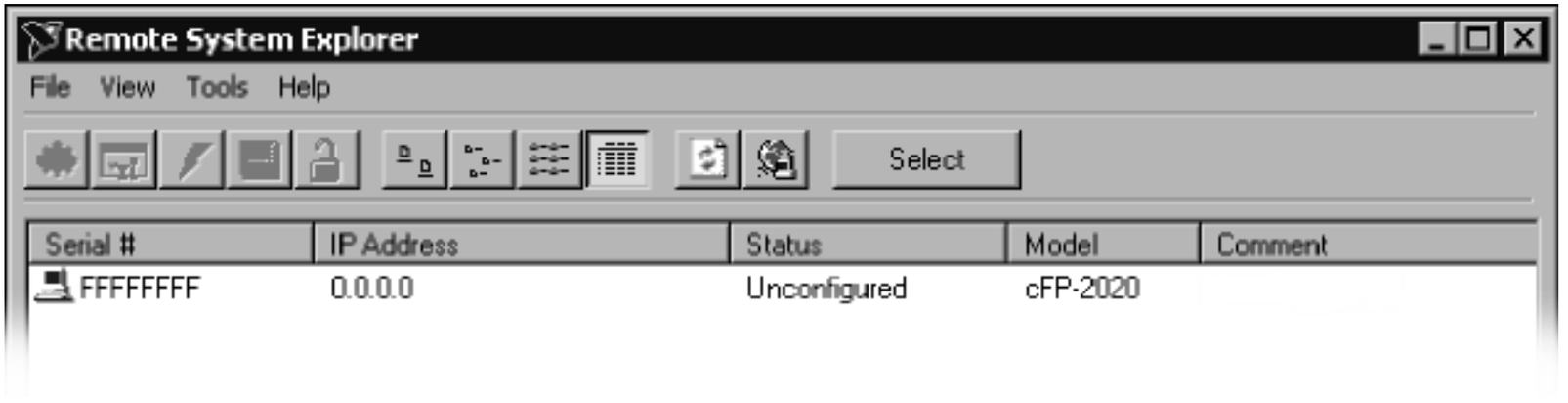


C. Click the **+** sign next to **IA Server with OPC** in the left pane to expand the view. Right-click **FieldPoint** and select **Add a comm resource to this server**. The Comm Resource Configuration dialog box appears.



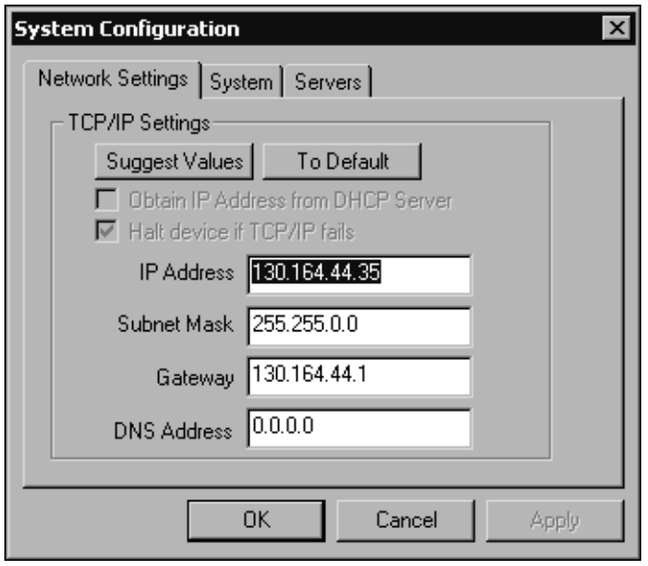

D. Set the Type to **Ethernet**, as shown in the following figure. Each Ethernet comm resource represents a single FieldPoint network module on the network.

E. Click **Browse** to launch Remote System Explorer. Remote System Explorer searches for any cFP-20*xx* or other National Instruments Ethernet devices on the subnet.




F. Double-click the serial number of the cFP-20*xx* you want to configure. Alternatively, you can right-click the controller and choose **Configure Device**.

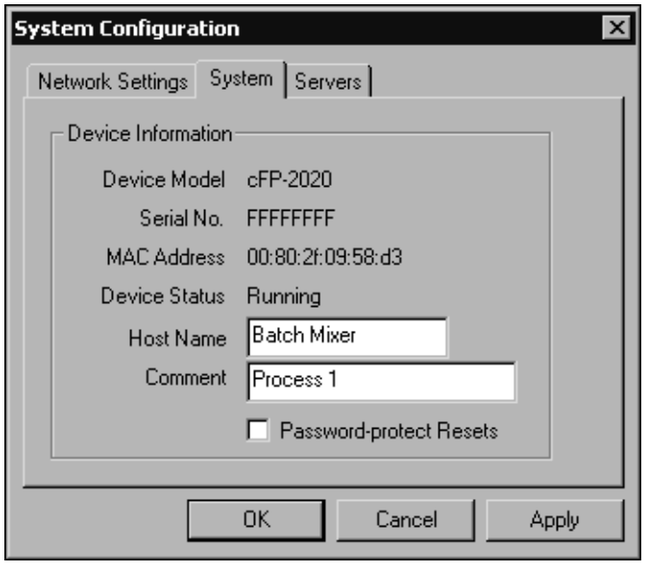
G. Enter values on the Network Settings tab of the System Configuration dialog box, shown in the figure at right. If your network does not have a gateway server or DNS server, you should set those parameters to 0.0.0.0.



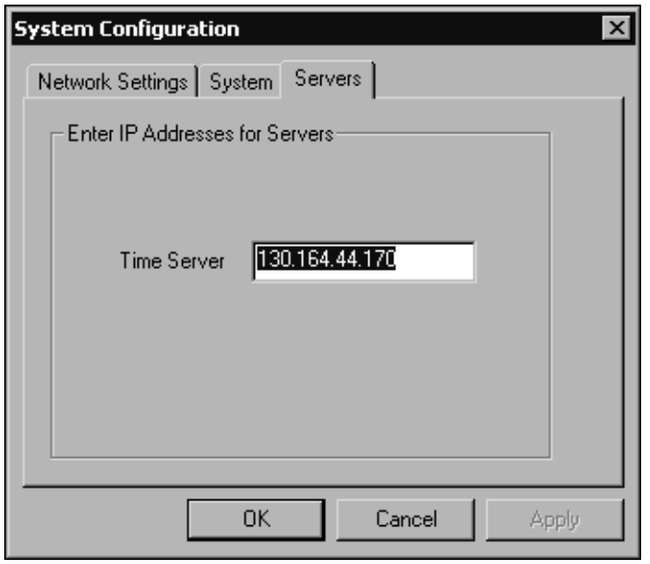

- **IP Address**—The unique, computer-readable address of a device on your network. An IP address is typically represented as four numbers separated by periods (for example, 130.164.55.112), where the numbers can be between 0 and 255, inclusive.
- **Subnet Mask**—A code that helps the network device determine whether another device is on the same subnet or a different subnet. The most common subnet mask is 255.255.255.0.
- **Gateway**—The IP address of a device that acts as a gateway server, which is a connection between two networks.
- **DNS Address**—The IP address of a network device that stores host names and translates them into IP addresses.

H. Enter values on the System tab of the System Configuration dialog box.

- **Host Name**—Can describe the physical location of the system or the application where it is being used.
- **Comment**—Helps to identify the controller.
- **Password-protect Resets**—Determines whether users are allowed to reset the Compact FieldPoint system remotely. If this checkbox is selected, a user must provide the password in order to reset the system remotely. You must disable resets from FieldPoint Explorer separately by setting user access to Read Only or Deny Access.



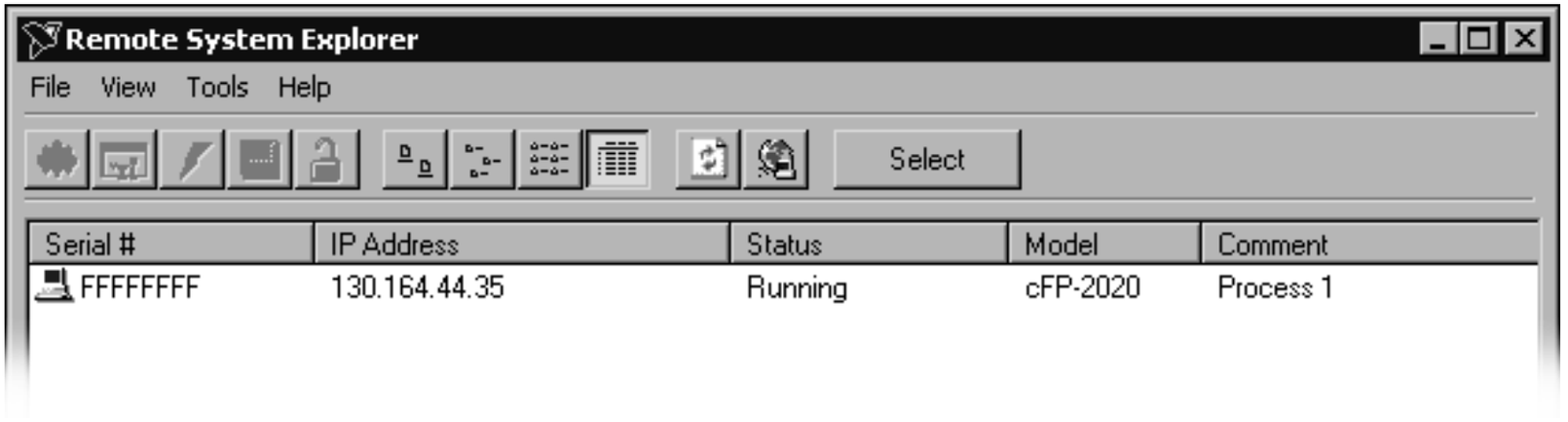
I. Enter an IP address for the Time Server on the Servers tab of the System Configuration dialog box, shown in the figure at right.




The time server is a networked computer that runs the National Instruments Time Service installed by FieldPoint Explorer. Enter the IP address of the PC you are using. When you finish configuring the controller, the time has been set and Time Server is not a required parameter. The cFP-20*xx* has an internal battery-backed clock that provides consistent timestamps in the absence of a time server.

J. Click **OK** in the System Configuration dialog box. Click **Yes** when prompted to reboot the cFP-20*xx*.

When the cFP-20*xx* reboots, it should appear in Remote System Explorer with the updated IP address and comment, as shown in the following figure. If it does not appear, select **View»Refresh** or refer to the user manual.




K. Highlight the serial number and click **Select**. When the new host name or IP address appears in the Comm Resource Configuration dialog box of FieldPoint Explorer, you can configure your devices and channels.

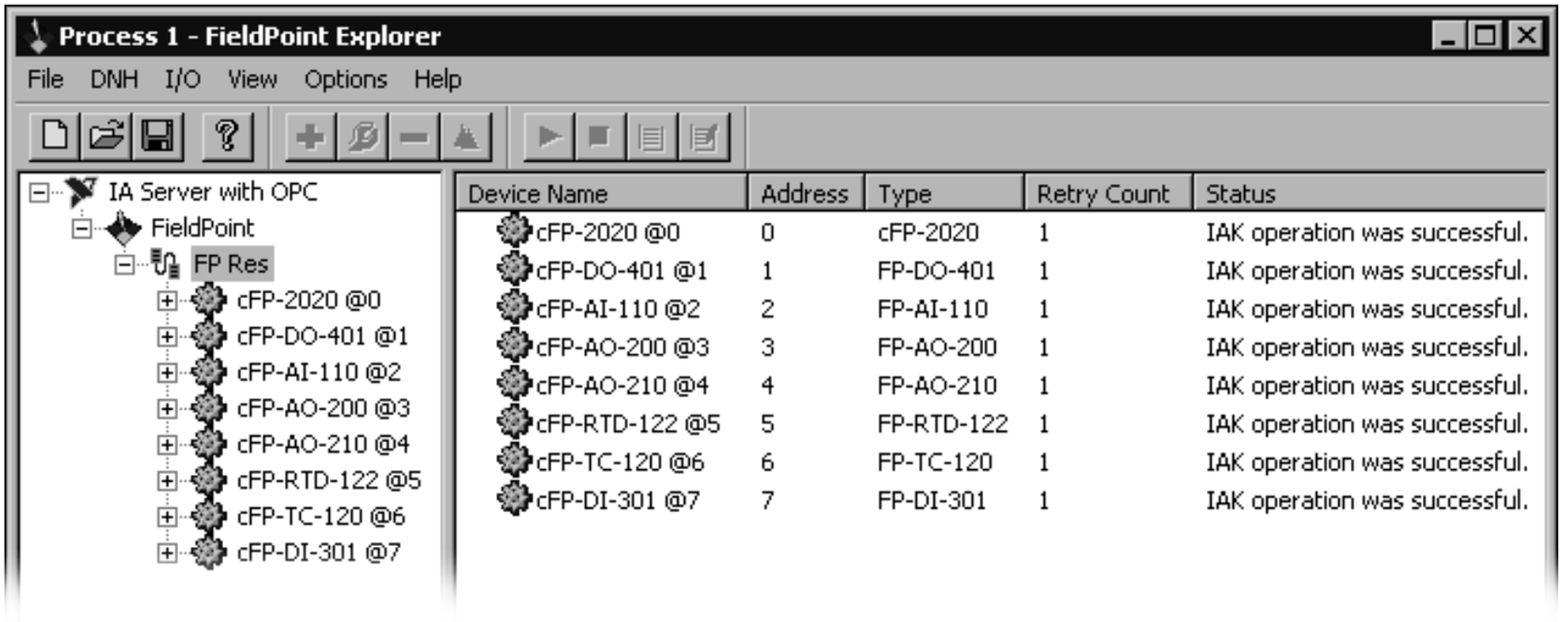
# 10 Finding and Configuring Devices and Channels

After you have configured the cFP-20*xx* in FieldPoint Explorer, follow these steps to configure Compact FieldPoint devices and channels.

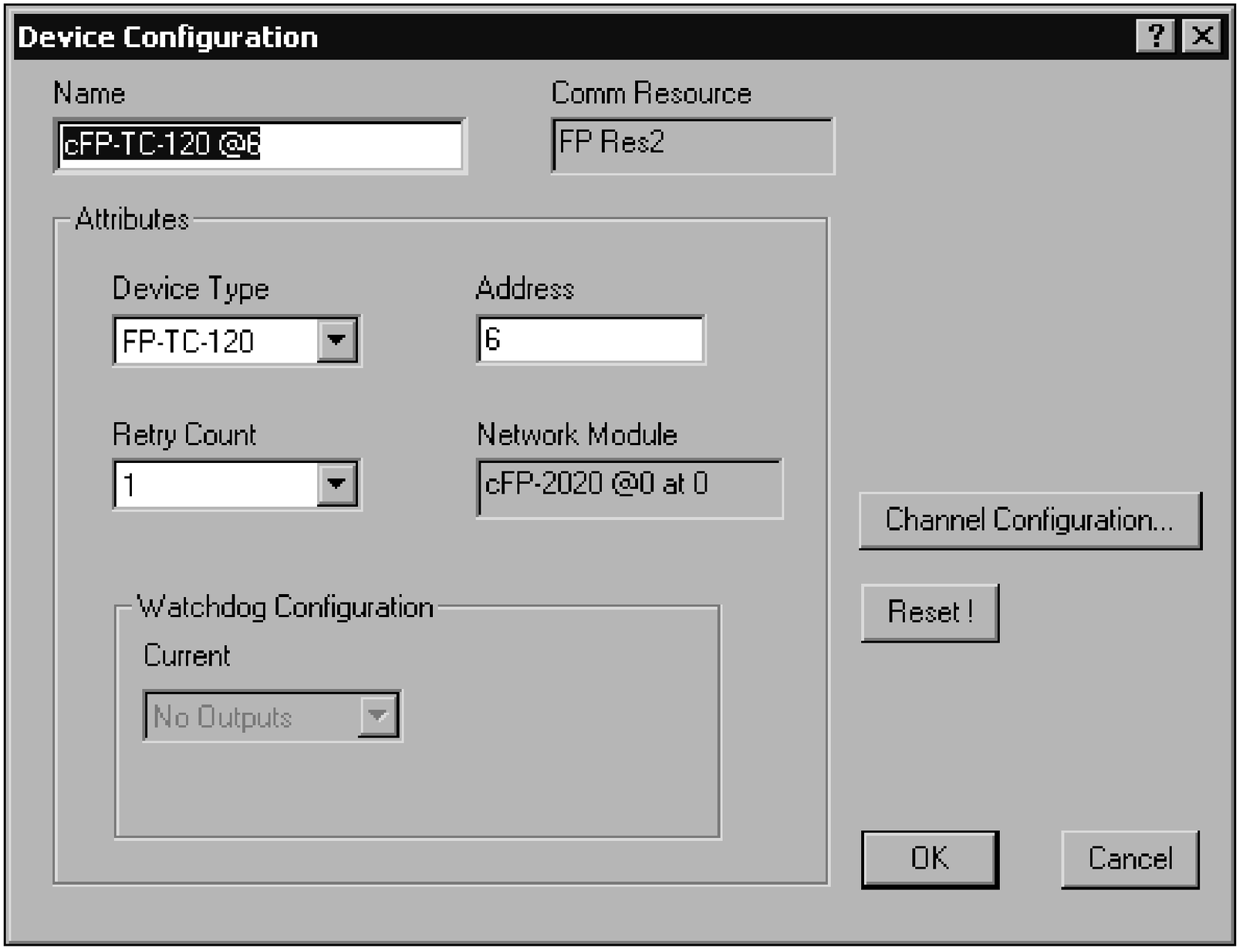
A. In the Comm Resource Configuration dialog box, click **Find Devices** to search for all of the devices connected to the cFP-20*xx*. If the Comm Resource Configuration dialog box is not already open, right-click the cFP-20*xx* in FieldPoint Explorer and select **Edit this comm resource**.

   If FieldPoint Explorer finds no devices, refer to the user manual.

B. After FieldPoint Explorer finds the Compact FieldPoint modules, click the **+** sign next to **FP Res** in the left pane to expand the device hierarchy and display the modules found on the network.


Process 1 - FieldPoint Explorer
File DNH I/O View Options Help
IA Server with OPC
FieldPoint
FP Res
cFP-2020 @0
cFP-DO-401 @1
cFP-AI-110 @2
cFP-AO-200 @3
cFP-AO-210 @4
cFP-RTD-122 @5
cFP-TC-120 @6
cFP-DI-301 @7
Device Name
Address
Type
Retry Count
Status
cFP-2020 @0 0 cFP-2020 1 IAK operation was successful.
cFP-DO-401 @1 1 FP-DO-401 1 IAK operation was successful.
cFP-AI-110 @2 2 FP-AI-110 1 IAK operation was successful.
cFP-AO-200 @3 3 FP-AO-200 1 IAK operation was successful.
cFP-AO-210 @4 4 FP-AO-210 1 IAK operation was successful.
cFP-RTD-122 @5 5 FP-RTD-122 1 IAK operation was successful.
cFP-TC-120 @6 6 FP-TC-120 1 IAK operation was successful.
cFP-DI-301 @7 7 FP-DI-301 1 IAK operation was successful.

   The hierarchy includes all of the modules connected to the cFP-20*xx*. The default name of each device found includes the name of the FieldPoint module, followed by a space, the @ sign, and the address of the module (for example, cFP-2000 @0). For each module found, one I/O Item is created for each channel on the module, and if all the channels are of the same type, one I/O Item is created to represent all the channels on that module collectively.




C. To configure the hardware settings of a particular I/O module, right-click the device name and select **Edit this device**. The Device Configuration dialog box appears, as shown in the figure above.

For output modules, you can choose settings for Watchdog Configuration. Refer to the user manual for information about the network watchdog feature.

D. Click **Channel Configuration** to access the Channel Configuration dialog box, shown in the figure at right.

**NOTE** Configuration options vary by module. The options listed here may not be available for some modules.

Make your selections in this dialog box as follows:

1. Select the type of channel to show, then select the channel(s) that you want to change. To select more than one channel, clear the **One channel at a time** checkbox.

2. Set the range and output values of the selected channel(s).

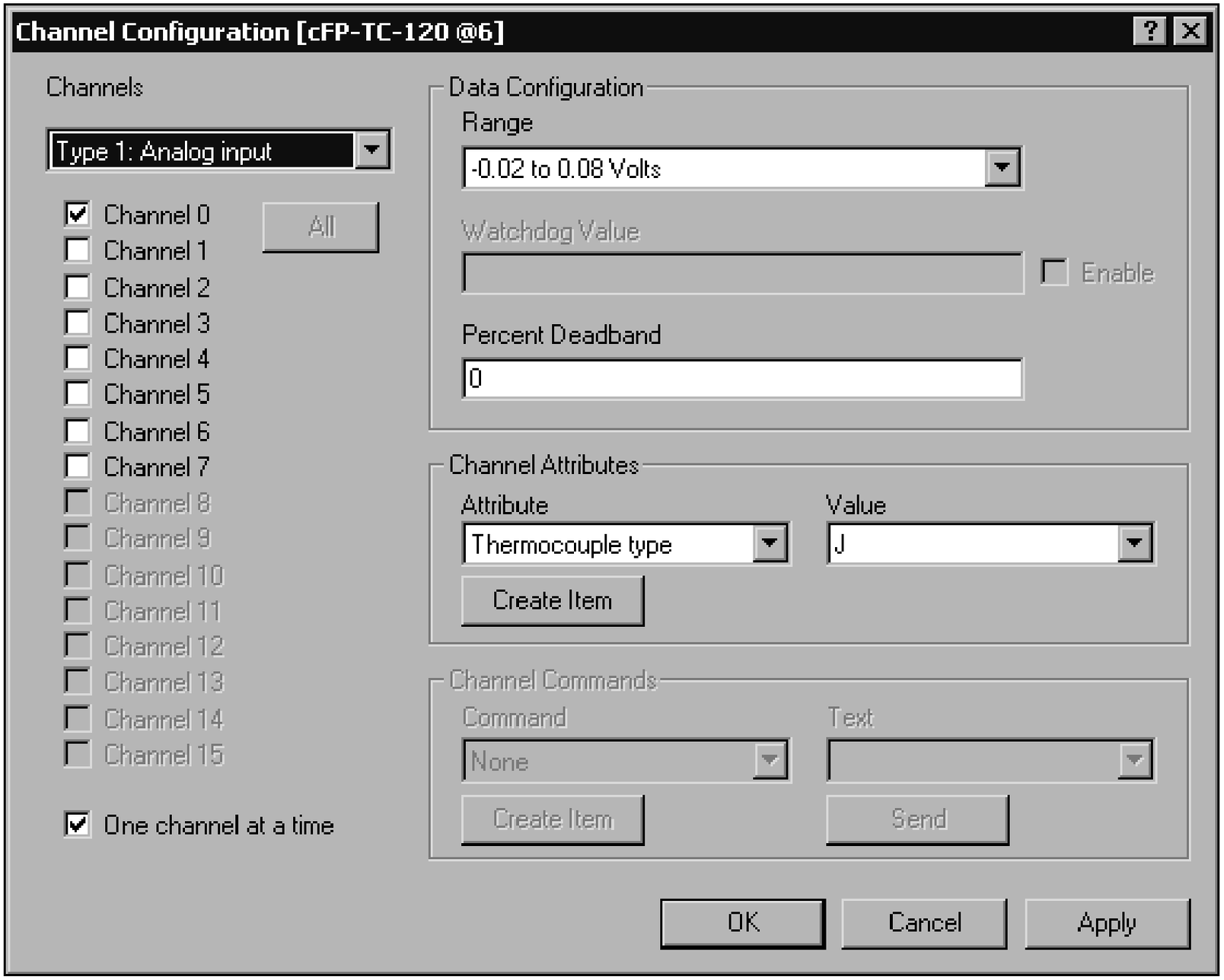
3. Set the deadband for data communication over the network. The deadband setting is a percentage of the full-scale range.

4. Set attributes for selected channel(s) by selecting the attribute and entering the desired value.

5. Send commands to the selected channel(s) by choosing a command and value and clicking **Send**.

6. Repeat this procedure for each channel you want to configure.

7. Click **OK**, or click **Apply** to save the changes and continue to configure channels. When you click **OK** or **Apply**, the changes are immediately sent to the device and saved in its nonvolatile memory.


Channel Configuration [cFP-TC-120 @6]
Channels
Type 1: Analog input
Channel 0
Channel 1
Channel 2
Channel 3
Channel 4
Channel 5
Channel 6
Channel 7
Channel 8
Channel 9
Channel 10
Channel 11
Channel 12
Channel 13
Channel 14
Channel 15
All
One channel at a time
Data Configuration
Range
-0.02 to 0.08 Volts
Watchdog Value
Enable
Percent Deadband
0
Channel Attributes
Attribute
Thermocouple type
Value
J
Create Item
Channel Commands
Command
None
Text
Create Item
Send
OK
Cancel
Apply

## 11 Saving Hardware Configuration as Power-Up State

When you are satisfied with the hardware configuration of the FieldPoint system, you can save this configuration as the new power-up state for the system.

A. Right-click the cFP-20*xx* controller in the left pane of FieldPoint Explorer, and select **Edit this device**.

B. Clear the factory configuration checkbox.

C. Specify the power-up settings with either of the following options:
   - If you want only the range and attribute settings you configured to be saved as power-up states, click **OK**. These settings are written to the nonvolatile memory of the controller.
   - If you want to save power-up values for the range and attribute settings and also all the current output states of the output channels, click **Snapshot**. This stores the current ranges, attributes, and output values of the bank to the nonvolatile memory of the network module. Click **OK** when you are finished.

**CAUTION** Using the Snapshot feature overwrites any power-up values you have specified for individual channels in the Channel Configuration dialog box.

Refer to the user manual for more information about configuring and changing the power-up values and configuring a network watchdog to guard against network failures.

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Australia 03 9879 5166, Austria 0662 45 79 90 0, Belgium 02 757 00 20, Brazil 55 11 3262 3599,
Canada (Calgary) 403 274 9391, Canada (Montreal) 514 288 5722, Canada (Ottawa) 613 233 5949,
Canada (Québec) 514 694 8521, Canada (Toronto) 905 785 0085, China 86 21 6555 7838,
Czech Republic 02 2423 5774, Denmark 45 76 26 00, Finland 09 725 725 11, France 01 48 14 24 24,
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